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0215785.7 9 July 2002 (09.07.2002) GB
- (71) Applicant (for all designated States except US): **ADCAP MEDIA LTD.** [GB/GB]; 5 Elstree Gate, Elstree Way, Borehamwood, Herts WD6 1JD (GB).
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- (75) Inventor/Applicant (for US only): **LOCK, Richard, Steven** [GB/GB]; 26 St. Leonard's Avenue, Chineham, Basingstoke, Hants RG24 8RD (GB).
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- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,

CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

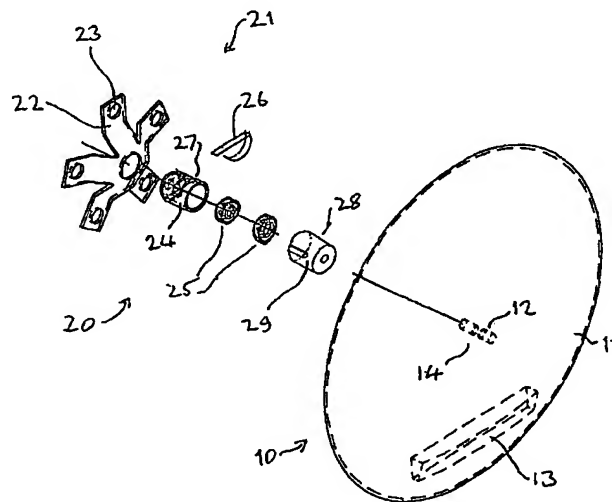
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**Declarations under Rule 4.17:**

— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG,

*[Continued on next page]*

(54) Title: **MOTOR VEHICLE ACCESSORY**



(57) Abstract: A hub cap assembly comprises a hub cap unit (10) mounted rotatably on a fixing unit (20) by a stub axle (12), which engages in a bearing unit (24, 25, 26, and 27), in the fixing unit. A weight (13) is attached off centre on the hub cap unit, so that that unit does not rotate with the vehicle wheel. The fixing unit includes a mount (21) has one or more cranked prongs (22) with holes (23) at their ends; it is attached to the vehicle wheel by unscrewing the wheel nuts, placing the fixing unit over the wheel bolts, and replacing the wheel nuts. The hub cap unit may comprise a pair of shells with a design between them, the outer shell being transparent.



ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

## Motor Vehicle Accessory

5           The present invention relates to motor vehicle accessories, and more specifically to hub caps.

          A car wheel is normally fixed to a disc on the end of a shaft by means of bolts; typically there are 5 bolts. In some designs, the bolts are left visible; in  
10 such designs, the portions of the wheel around the bolts are often shaped into a heavily moulded appearance. In many designs, however, the bolts are covered by a hub cap which clips onto the wheel. The hub cap is roughly disc shaped, and is usually formed with a distinctive pattern. The hub caps will of course rotate with the wheel.

15

          The object of the present invention is to provide a hub cap with a novel appearance.

          According to the main aspect of the invention there is provided a hub cap  
20 assembly comprising a fixing attachable to a wheel and a cap unit rotatably mounted on the fixing and weighted to maintain its orientation relative to the ground despite rotation of the wheel, characterized in that the fixing includes a mount having its centre aligned with the wheel axle and at least one aperture radially spaced from the wheel axle for placement on a wheel bolt and retention thereon by  
25 the associated wheel nut. Preferably the fixing comprises a plurality of radial spokes each with a corresponding aperture. Optionally some of the apertures may be replaced by forks. The number of spokes may be less than the number of wheel bolts.

30           The invention also provides a method of attaching a hub cap assembly to a wheel, the hub cap assembly including a fixing attachable to the wheel and a

weighted rotatable cap unit, characterized in that the fixing is bolted to the wheel using the wheel nuts and bolts.

The invention also provides a hub cap assembly including a fixing attach-  
5 able to a wheel and a weighted rotatable cap unit, characterized in that the cap unit comprises an inner shell and an outer transparent shell attached to the inner shell.

With conventional hub caps, the pattern normally has high rotational sym-  
metry. The pattern is effectively not visible when the car is moving at significant  
10 speed; when the car is stooped, the pattern may have any orientation. Since the present hub cap assembly, in contrast, maintains its orientation relative to the ground, any pattern on it will always have the same orientation. The pattern can therefore be for example pictorial, and/or can incorporate wording. One potential application of the present hub cap assembly is for advertising purposes.

15 The discussion above has been primarily in terms of cars, since hub caps are used on cars to a much larger extent than on for example commercial vehicles. However, the present hub cap assembly can be used equally well on commercial vehicles and other motor vehicles.

20 A hub cap assembly and various modifications thereof, all embodying the invention, will now be described by way of example and with reference to the drawings, in which:

Fig. 1 is an exploded perspective view of the hub cap assembly;

25 Fig. 2 is a side view of the hub cap unit of the assembly;

Fig. 3 shows a modified mount for the fixing unit of the assembly, in plan and elevation; and

Fig. 4 shows a modified hub cap unit.

30 The hub cap assembly comprises a hub cap unit 10 and a fixing unit 20.

The hub cap unit 10 comprises a hub cap element 11 which is slightly dished, as shown in Fig. 2. A stub axle 12 with a groove 14 is mounted at its centre and a weight 13 is attached to it as shown.

5 The fixing unit 20 comprises a mount 21 with a bearing housing 24 attached to it, a pair of bearings 25 mounted inside the housing 24, and a retaining clip 26. The housing 24 has a slot 27 into which the retaining clip 26 fits. There is preferably also a housing cover 28 which fits over the housing 24; this may have a slot 29 to accommodate the left-hand end of the straight portion of the clip 26.  
10 The mount 21 has 5 prongs or spokes 22, each with a respective hole 23 at its end. These prongs are cranked so as to hold the housing 24 above the level of the ends of the prongs and thereby provide clearance for the end of the wheel axle. The mount is dimensioned to fit on the bolts of a standard wheel disc.

15 To fix the fixing unit 20, the wheel nuts of the wheel are removed, the mount 21 is placed against the wheel and on the wheel bolts, and the wheel nuts refitted. The hub cap unit 10 can then be fitted to the fixing unit by pressing the stub axle 12 into the bearings 25 in the housing 24. The clip 26 engages with the groove 14 in the stub axle and retains the hub cap unit in engagement with the fix-  
20 ing unit.

The hub cap unit can rotate freely on the stub axle in the bearing housing. The weight 13 will move to the lowest point, so maintaining the orientation of the hub cap unit as shown. Any pattern printed or attached to the hub cap unit  
25 element 11 will therefore retain the same orientation regardless of the angular position of the wheel.

The mount 21 has to match the design of the wheel to which it is to be fixed. A range of mounts for different vehicle manufacturers may therefore be  
30 provided. The mount may have one or more prongs omitted; 3 prongs are clearly sufficient for adequate mounting. Slits may be used instead of the holes 23, to

allow for bolts at different radii from the wheel axle for different manufacturers. Fig. 3 shows a modified mount 21' for use with wheels having an even number of wheel nuts; this mount has a central hole 31 to which the housing 24 is fixed, a hole 32 at one end, and a fork 33 at the other end; the hole 32 and the fork 33 engage with the wheel bolts. Obviously other means, eg clip means engaging with radial elements of the wheel or wheel mounting, may be used instead.

Fig. 4 shows a modified hub cap unit 10', which comprises an inner shell 10A and an outer shell 10B. The inner shell has the stub axle 12, with its groove 14, fixed to it via a fixing plate 17, and has the weight 13 fixed to it. The inner shell also has a ring of tubular fixing points 15 near its periphery. The outer shell 10B has a corresponding ring of fixing pins 16, with prongs on their ends, to attach it firmly to the inner shell 10A, and also has a protective rim 18 as shown. The design can be painted or otherwise formed on the inner shell 10A, or can be a separate sheet of material which is held between the inner and outer shells. The outer shell is made of transparent material, and protects the design.

The engagement of the hub cap unit 10 and the fixing unit 20 may be made releasable under a strong pull on the hub cap unit, to allow access to the wheel for tyre pressure checking and wheel changing. Alternatively, the hub cap element may be made with apertures allowing access to the inner parts of the wheel and with a cover plate which clips removably over it.

In summary, the invention provides, in its preferred forms, a hub cap assembly comprises a hub cap unit 10 mounted rotatably on a fixing unit 20 by a stub axle 12 which engages in a bearing unit 24, 25, 26, 27 in the fixing unit. A weight 13 is attached off centre on the hub cap unit, so that that unit does not rotate with the vehicle wheel. The fixing unit includes a mount 21 has one or more cranked prongs 22 with holes 23 at their ends; it is attached to the vehicle wheel by unscrewing the wheel nuts, placing the fixing unit over the wheel bolts,

and replacing the wheel nuts. The hub cap unit may comprise a pair of shells with a design between them, the outer shell being transparent.

## Claims

5 1 A hub cap assembly comprising a fixing (20) attachable to a wheel and a cap unit (10) rotatably mounted on the fixing and weighted (13) to maintain its orientation relative to the ground despite rotation of the wheel, characterized in that the fixing (20) includes a mount (21) having its centre aligned with the wheel axle and at least one aperture (23) radially spaced from the wheel axle for place-  
10 ment on a wheel bolt and retention thereon by the associated wheel nut.

2 A hub cap assembly according to claim 1 wherein the fixing comprises a plurality of radial spokes (22) each with a corresponding aperture.

15 3 A hub cap assembly according to claim 2 characterized in that some of the apertures are replaced by forks (33).

4 A hub cap assembly according to either of claims 2 and 3 characterized in that the number of spokes is less than the number of wheel bolts.

20

5 A hub cap assembly according to any previous claim characterized in that the cap unit (10) and fixing (20) are coupled together by means of a stub shaft (12) passing into a bearing assembly (24-27) including a clip (26) for retaining the stub shaft in the bearing assembly.

25

6 A method of attaching a hub cap assembly to a wheel, the hub cap assembly including a fixing (20) attachable to the wheel and a weighted rotatable cap unit (10), characterized in that the fixing is bolted to the wheel using the wheel nuts and bolts.

30



7 A hub cap assembly including a fixing (20) attachable to a wheel and a weighted rotatable cap unit (10), characterized in that the cap unit (10) comprises an inner shell (10A) and an outer transparent shell (10B) attached to the inner shell.

5

8 Any feature of novelty or combination thereof within the meaning of Article 4H of the International Convention (Paris Convention).

FIG. 2

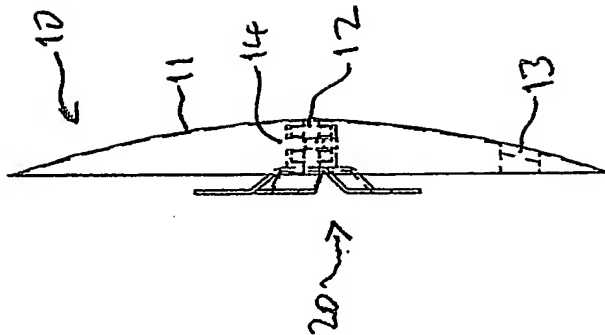
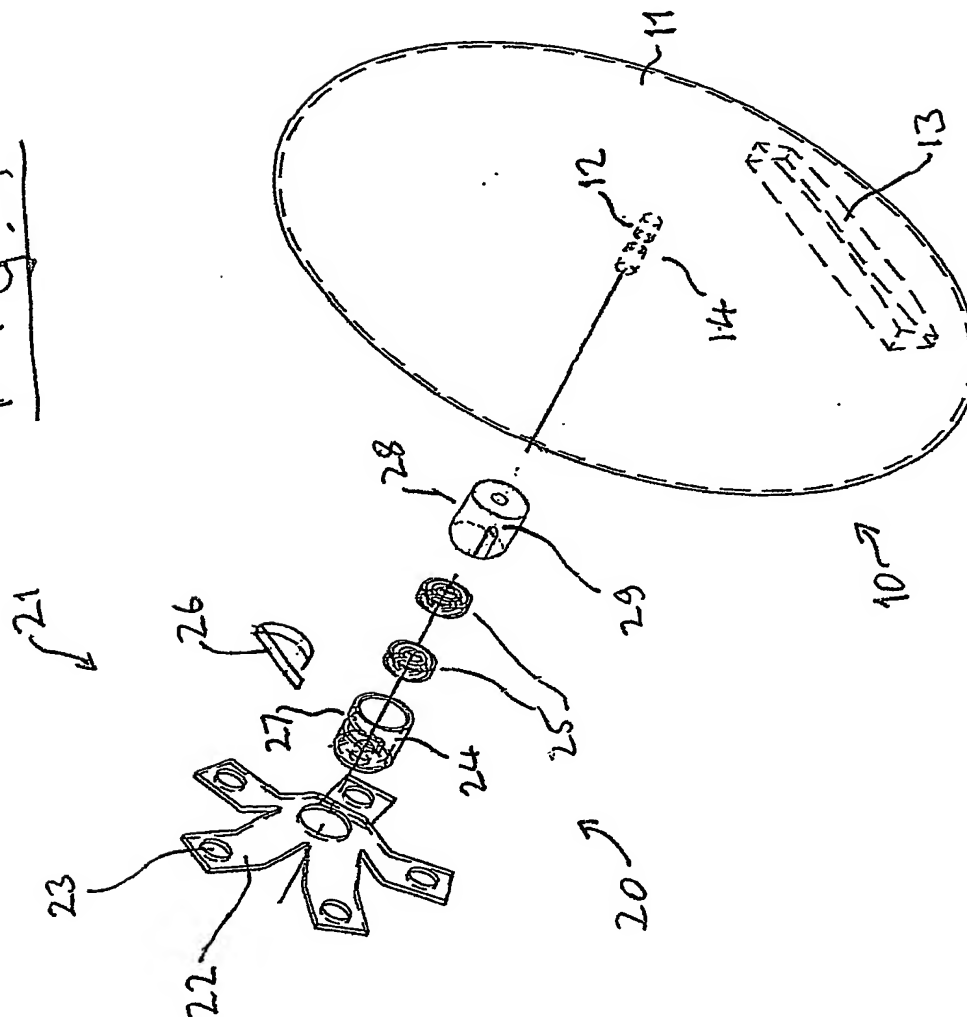


FIG. 1



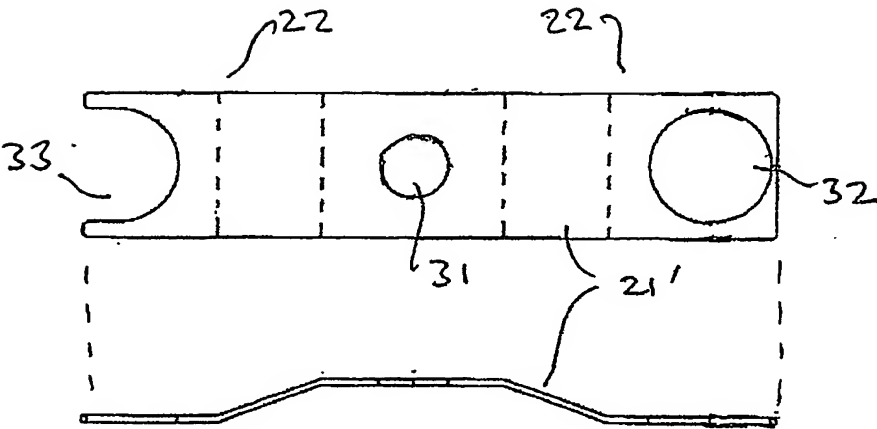


FIG. 3

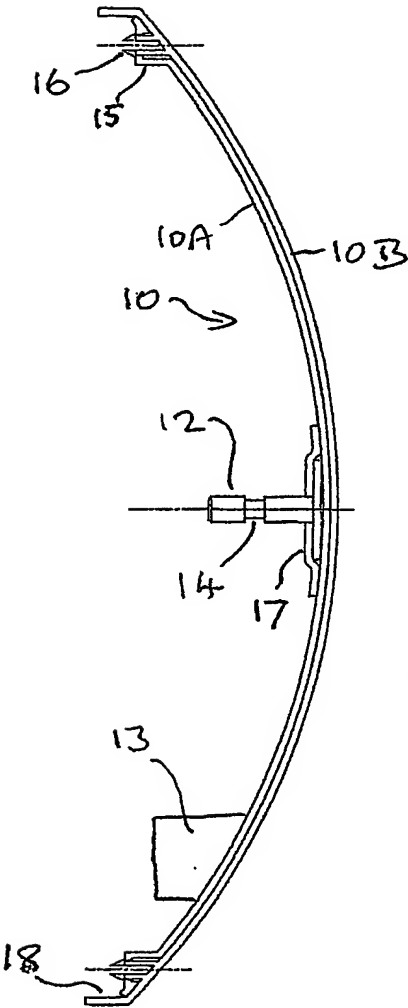


FIG. 4

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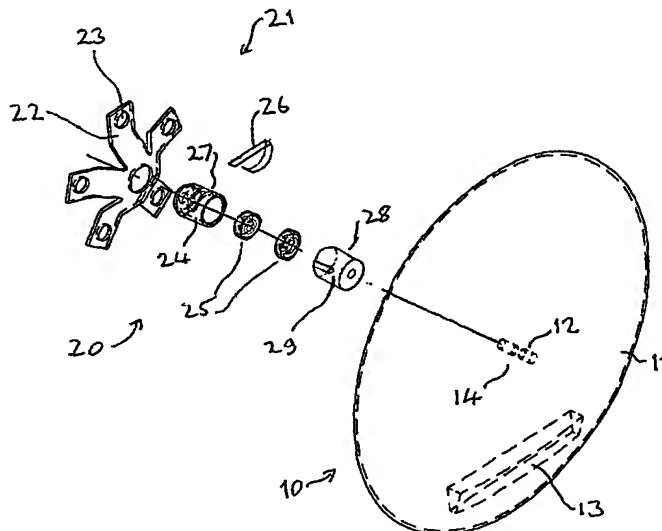
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- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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[Continued on next page]

(54) Title: ROTATABLY MOUNTED HUB CAR FOR VEHICLES



(57) Abstract: A hub cap assembly comprises a hub cap unit (10) mounted rotatably on a fixing unit (20) by a stub axle (12), which engages in a bearing unit (24, 25, 26, and 27), in the fixing unit. A weight (13) is attached off centre on the hub cap unit, so that that unit does not rotate with the vehicle wheel. The fixing unit includes a mount (21) has one or more cranked prongs (22) with holes (23) at their ends; it is attached to the vehicle wheel by unscrewing the wheel nuts, placing the fixing unit over the wheel bolts, and replacing the wheel nuts. The hub cap unit may comprise a pair of shells with a design between them, the outer shell being transparent.



KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

— as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations

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# INTERNATIONAL SEARCH REPORT

National Application No  
PCT/GB 03/02966

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 B60B7/20

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 B60J G09F B60B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ, WPI Data

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 048 036 A (ALAOUI MRANI MUSTAPHA) 11 April 2000 (2000-04-11)	1-3,6
Y	column 2, line 10 - line 14 column 2, line 35 - line 41 column 3, line 61 - column 4, line 9 figures 1,2A,5,6	5,7
X	PATENT ABSTRACTS OF JAPAN vol. 009, no. 176 (M-398), 20 July 1985 (1985-07-20) -& JP 60 047701 A (SHINSEI SANGYO KK), 15 March 1985 (1985-03-15) abstract	1,6
A		5
Y	US 5 659 989 A (HSIAO LESLIE ET AL) 26 August 1997 (1997-08-26) column 8, line 30 - line 38	5
	-/--	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

\* Special categories of cited documents:

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
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- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \*G\* document member of the same patent family

Date of the actual completion of the international search

23 January 2004

Date of mailing of the international search report

29/01/2004

Name and mailing address of the ISA

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Verkerk, E

# INTERNATIONAL SEARCH REPORT

International Application No.

PCT/GB 03/02966

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	PATENT ABSTRACTS OF JAPAN vol. 2003, no. 01, 14 January 2003 (2003-01-14) -& JP 2002 274104 A (OKAMOTO YOSHIKI), 25 September 2002 (2002-09-25) abstract; figures 36,41,42,46 ----	1-4
Y	WO 99 33675 A (HANDELSMAATSCHAPPY HEA N V ;LUSSE MIRJAM (NL); LOOYEN GERARDUS MAR) 8 July 1999 (1999-07-08) claims 27,28; figure 8 ----	7
A	FR 1 069 953 A (FESTA ROBERTO) 15 July 1954 (1954-07-15) figure 5 -----	5

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/GB 03/02966

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.: 8  
because they relate to subject matter not required to be searched by this Authority, namely:  
Claim 8 does not comply with Rule 6.3(a) PCT, as it does not contain any technical features relating to the invention.
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.  
☐ No protest accompanied the payment of additional search fees.



# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 03/02966

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